What is claimed is:

1. A method for performing a hot start polymerase chain reaction (PCR), comprising:

loading a reaction mixture in a reaction channel of a microfluidic device, said reaction mixture comprising primers, template molecules, and buffers but no polymerase enzyme;

applying an electrical current to heat the reaction channel; and

delivering a polymerase enzyme into the reaction channel.

2. The method of claim 1, wherein the reaction is a thermocyclic reaction.

3. The method of claim 1, wherein the reaction mixture comprises a series of reaction mixture slugs, whereby each reaction mixture slug comprises primers, template molecule, and buffers but no polymerase enzyme.

4. The method of claim 1, wherein the polymerase enzyme is delivered subsequent to the delivery of a first reaction mixture slug into the reaction channel.

5. The method of claim 1, wherein the reaction comprises denaturation of the template molecule, wherein the template molecule is denatured to provide a plurality of single stranded template molecules.

6. The method of claim 1, wherein the denaturation comprises incubation of said template molecule with a base.

7. The method of claim 1, said reaction comprising hybridization of the primer molecules to the template molecules.

8. A method for performing a temperature mediated reaction, comprising:

loading a first component of the temperature mediated reaction in a reaction channel of a microfluidic device;

applying an electrical current to heat the reaction channel; and

delivering a second component of the temperature mediated reaction into the reaction channel.

9. A method of claim 8, wherein the first component comprises a reaction mixture; said reaction mixture comprising starting materials for the temperature mediated reaction.

10. The method of claim 8, wherein the first component comprises amplification reagents for PCR comprising a template nucleic acid, a primer sequence and nucleotides.

11. The method of claim 8, wherein the second component comprises a thermally stable polymerase enzyme.

12. The method of claim 8, wherein the second component comprises DNA polymerase enzyme.

13. The method of claim 8, wherein the electrical current is an alternating current.

14. The method of claim 8 further comprising repeatedly cycling a temperature within the reaction channel for carrying out denaturation, annealing and extension reactions within the temperature mediated reaction, wherein cycling the temperature comprises variably applying the electrical current.